



2004 Water Year CHRISTINA RIVER BASIN

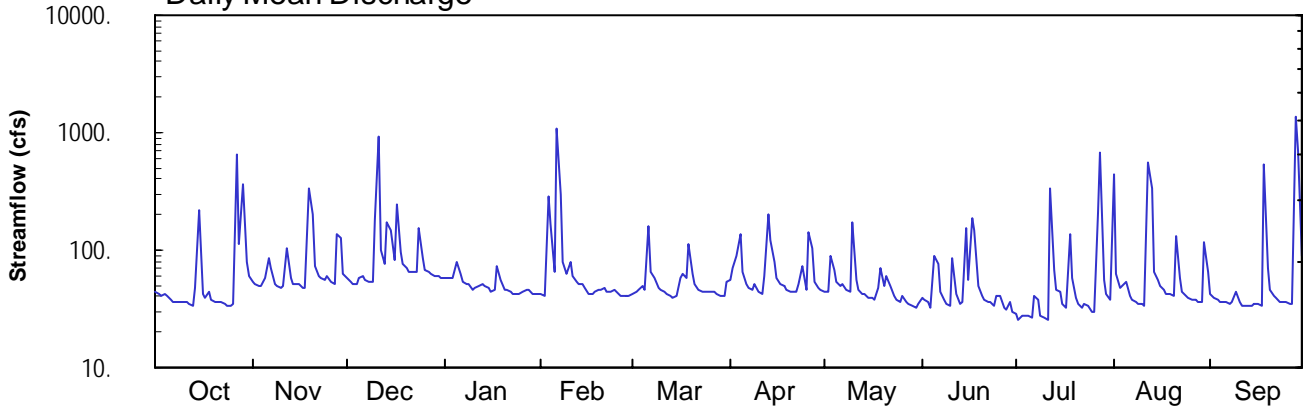
01479820 Red Clay Creek near Kennett Square, PA

Latitude: 39° 49 ' 00"
Chester County

Longitude: 075° 41 ' 31"
Datum: 200 feet

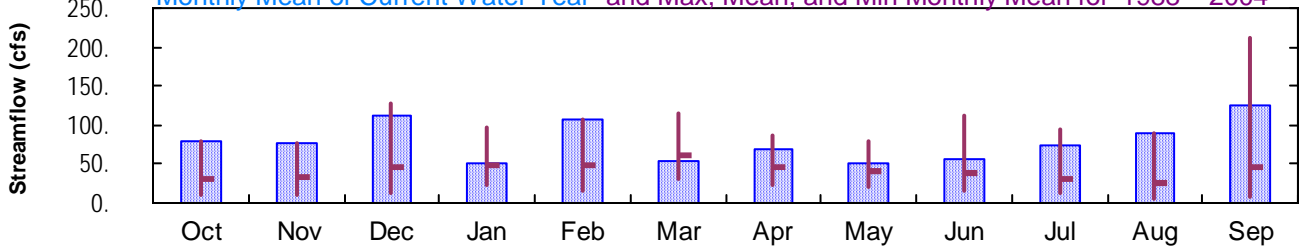
Hydrologic Unit Code: 02040205
Drainage Area: 28.3 mi²

Daily Mean Discharge

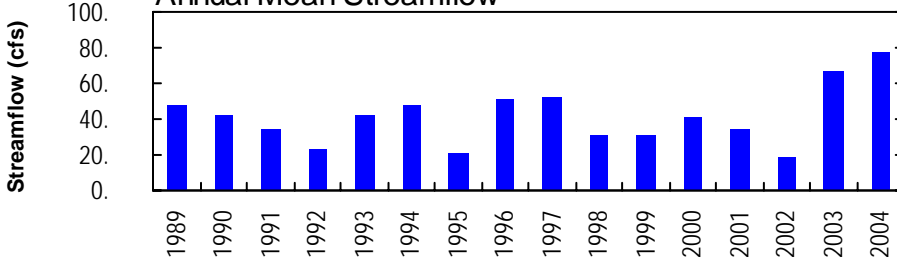


Monthly Statistics

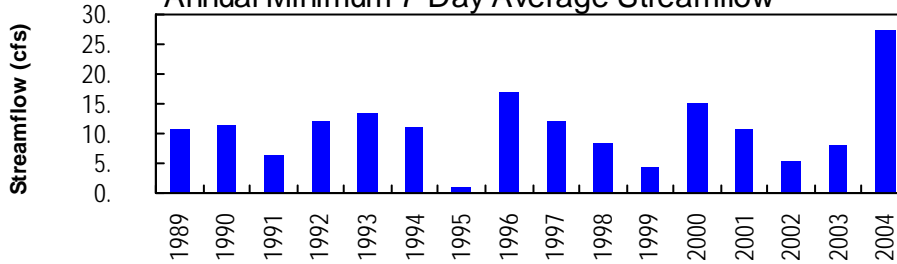
Monthly Mean of Current Water Year and Max, Mean, and Min Monthly Mean for 1988 – 2004



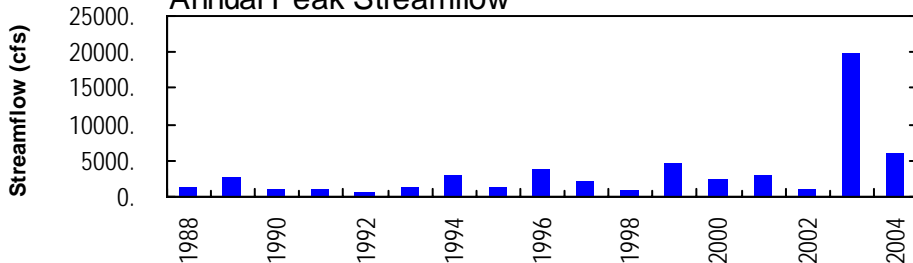
Annual Mean Streamflow



Annual Minimum 7-Day Average Streamflow



Annual Peak Streamflow



01479820-Red Clay Creek near Kennett Square

CHRISTINA RIVER BASIN

**01479820 RED CLAY CREEK NEAR KENNETT SQUARE, PA
(Pennsylvania Water-Quality Network Station)**

LOCATION.--Lat 39°49'00", long 75°41'31", Chester County, Hydrologic Unit 02040205, on left bank along SR 82 (Creek Road), and 3.0 mi south of the intersection of SR 82 and U.S. Highway 1 at Kennett Square.

DRAINAGE AREA.--28.3 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1988 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 196.02 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. Some regulation upstream of gage. Several measurements of water temperature were made during the year. Satellite telemetry at station.

PEAK DISCHARGES FOR CURRENT YEAR.--Peak discharges greater than a base discharge of 1,000 ft³/s and maximum (*):

| Date | Time | Discharge ft ³ /s | Gage Height (ft) | Date | Time | Discharge ft ³ /s | Gage Height (ft) |
|---------|------|---------------------------------|---------------------|----------|------|---------------------------------|---------------------|
| Oct. 27 | 1615 | 1,430 | 6.19 | July 28 | 0115 | 3,290 | 7.78 |
| Nov. 19 | 1845 | 1,340 | 6.07 | Aug. 1 | 1145 | 1,520 | 6.30 |
| Dec. 11 | 0730 | 2,120 | 6.87 | Aug. 12 | 2030 | 2,730 | 7.37 |
| Feb. 6 | 1600 | 2,880 | 7.48 | Sept. 18 | 1415 | 1,750 | 6.55 |
| July 12 | 1530 | 1,300 | 6.02 | Sept. 28 | 2015 | *6,080 | *9.65 |

**DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES**

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | 43 | 54 | 57 | 57 | 42 | 42 | 56 | 44 | 39 | 28 | 443 | 43 |
| 2 | 42 | 51 | 53 | 58 | 41 | 45 | 71 | 44 | 38 | 25 | 62 | 40 |
| 3 | 40 | 50 | 51 | 58 | 288 | 45 | 91 | 89 | 36 | 28 | 47 | 38 |
| 4 | 42 | 49 | 51 | 58 | 166 | 50 | 138 | 68 | 32 | 27 | 50 | 37 |
| 5 | 41 | 59 | 58 | 78 | 66 | 46 | 65 | 54 | 90 | 27 | 54 | 36 |
| 6 | 38 | 85 | 61 | 62 | 1080 | 158 | 52 | 50 | 76 | 26 | 40 | 36 |
| 7 | 37 | 70 | 57 | 53 | 299 | 64 | 48 | 52 | 44 | 41 | 38 | 35 |
| 8 | 37 | 52 | 54 | 51 | 78 | 57 | 46 | 46 | 37 | 37 | 37 | 36 |
| 9 | 36 | 49 | 54 | 52 | 62 | 48 | 51 | 43 | 35 | 28 | 35 | 44 |
| 10 | 36 | 48 | 179 | 46 | 78 | 46 | 44 | 174 | 34 | 26 | 35 | 36 |
| 11 | 36 | 49 | 938 | 47 | 60 | 44 | 43 | 55 | 86 | 26 | 34 | 34 |
| 12 | 35 | 104 | 100 | 50 | 53 | 42 | 60 | 46 | 43 | 337 | 560 | 33 |
| 13 | 34 | 58 | 75 | 51 | 52 | 40 | 199 | 42 | 35 | 69 | 329 | 33 |
| 14 | 49 | 52 | 172 | 49 | 51 | 40 | 124 | 42 | 36 | 45 | 64 | 34 |
| 15 | 219 | 51 | 148 | 47 | 47 | 41 | 81 | 40 | 151 | 44 | 55 | 34 |
| 16 | 43 | 51 | 81 | 45 | 43 | 59 | 57 | 40 | 55 | 35 | 49 | 34 |
| 17 | 39 | 48 | 242 | 45 | 42 | 63 | 52 | 38 | 187 | 32 | 45 | 34 |
| 18 | 44 | 47 | 97 | 73 | 44 | 57 | 49 | 47 | 147 | 135 | 43 | 540 |
| 19 | 37 | 340 | 77 | 55 | 45 | 114 | 46 | 69 | 49 | 58 | 42 | 70 |
| 20 | 36 | 202 | 69 | 46 | 46 | 62 | 45 | 49 | 41 | 39 | 40 | 46 |
| 21 | 36 | 72 | 65 | 45 | 48 | 52 | 44 | 60 | 37 | 34 | 133 | 41 |
| 22 | 36 | 61 | 65 | 44 | 45 | 46 | 43 | 49 | 36 | 32 | 59 | 39 |
| 23 | 34 | 58 | 64 | 42 | 44 | 44 | 52 | 40 | 37 | 35 | 44 | 37 |
| 24 | 34 | 56 | 153 | 42 | 45 | 43 | 74 | 37 | 34 | 33 | 41 | 36 |
| 25 | 34 | 59 | 84 | 42 | 44 | 45 | 46 | 36 | 41 | 30 | 40 | 36 |
| 26 | 35 | 53 | 68 | 44 | 41 | 44 | 141 | 41 | 41 | 29 | 38 | 35 |
| 27 | 658 | 52 | 64 | 45 | 41 | 44 | 106 | 37 | 33 | 211 | 38 | 34 |
| 28 | 114 | 139 | 61 | 45 | 41 | 42 | 54 | 35 | 31 | 678 | 37 | 1390 |
| 29 | 365 | 125 | 61 | 43 | 41 | 41 | 48 | 33 | 36 | 55 | 36 | 704 |
| 30 | 79 | 62 | 61 | 43 | --- | 41 | 46 | 32 | 30 | 43 | 116 | 90 |
| 31 | 60 | --- | 58 | 42 | --- | 53 | --- | 35 | --- | 38 | 65 | --- |
| TOTAL | 2449 | 2306 | 3478 | 1558 | 3073 | 1658 | 2072 | 1567 | 1647 | 2331 | 2749 | 3715 |
| MEAN | 79.0 | 76.9 | 112 | 50.3 | 106 | 53.5 | 69.1 | 50.5 | 54.9 | 75.2 | 88.7 | 124 |
| MAX | 658 | 340 | 938 | 78 | 1080 | 158 | 199 | 174 | 187 | 678 | 560 | 1390 |
| MIN | 34 | 47 | 51 | 42 | 41 | 40 | 43 | 32 | 30 | 25 | 34 | 33 |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2004, BY WATER YEAR (WY)

| | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| MEAN | 30.1 | 34.4 | 45.6 | 47.3 | 48.6 | 62.3 | 46.9 | 40.9 | 38.5 | 29.8 | 26.3 | 45.5 |
| MAX | 79.0 | 76.9 | 128 | 96.1 | 106 | 116 | 85.5 | 79.2 | 112 | 94.5 | 88.7 | 212 |
| (WY) | 2004 | 2004 | 1997 | 1996 | 2004 | 1994 | 1993 | 1989 | 2003 | 1989 | 2004 | 2003 |
| MIN | 10.8 | 10.9 | 12.9 | 22.0 | 16.6 | 30.5 | 21.7 | 21.7 | 16.0 | 12.0 | 5.84 | 8.83 |
| (WY) | 1995 | 1999 | 1999 | 1992 | 2002 | 2002 | 2002 | 1999 | 1995 | 1995 | 1995 | 1995 |

CHRISTINA RIVER BASIN

01479820 RED CLAY CREEK NEAR KENNETT SQUARE, PA--Continued

| SUMMARY STATISTICS | FOR 2003 CALENDAR YEAR | | FOR 2004 WATER YEAR | | WATER YEARS 1988 - 2004 | |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|-------------|
| ANNUAL TOTAL | 28910 | | 28603 | | | |
| ANNUAL MEAN | 79.2 | | 78.2 | | 41.6 | |
| HIGHEST ANNUAL MEAN | | | | | 78.2 2004 | |
| LOWEST ANNUAL MEAN | | | | | 18.9 2002 | |
| HIGHEST DAILY MEAN | 4150 | Sep 15 | 1390 | Sep 28 | 4150 | Sep 15 2003 |
| LOWEST DAILY MEAN | 15 | Feb 16 | 25 | Jul 2 | 0.86 | Sep 3 1995 |
| ANNUAL SEVEN-DAY MINIMUM | 17 | Sep 6 | 27 | Jun 30 | 1.1 | Sep 2 1995 |
| MAXIMUM PEAK FLOW | | | a6080 | Sep 28 | a19700 | Sep 15 2003 |
| MAXIMUM PEAK STAGE | | | 9.65 | Sep 28 | b15.30 | Sep 15 2003 |
| 10 PERCENT EXCEEDS | 119 | | 124 | | 62 | |
| 50 PERCENT EXCEEDS | 40 | | 46 | | 28 | |
| 90 PERCENT EXCEEDS | 22 | | 35 | | 13 | |

- a From rating curve extended above 2,580 ft³/s from slope-conveyance determination of discharge at gage height 15.30 ft.
- b From outside highwater mark.

CHRISTINA RIVER BASIN

01479820 RED CLAY CREEK NEAR KENNETT SQUARE, PA--Continued
(Pennsylvania Water-Quality Network Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2002 to current year.

COOPERATION.--Samples were collected as part of the Pennsylvania Department of Environmental Protection Water-Quality Network (WQN) with cooperation from the Pennsylvania Department of Environmental Protection.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

| Date | Time | Agency collecting sample, code (00027) | Agency analyzing sample, code (00028) | Instantaneous discharge, cfs (00061) | Dissolved oxygen, mg/L (00300) | pH, water, unfltrd field, std units (00400) | pH, water, unfltrd lab, std units (00403) | Specif. conductance, wat unfltrd lab, µS/cm 25 degC (90095) | Specif. conductance, wat unfltrd lab, µS/cm 25 degC (00095) | Temperature, water, deg C (00010) | Hardness, water, mg/L as CaCO3 (00900) | Calcium water unfltrd recover -able, mg/L (00916) | Magnesium, water, unfltrd recover -able, mg/L (00927) |
|----------------|------|--|---------------------------------------|--------------------------------------|--------------------------------|---|---|---|---|-----------------------------------|--|---|---|
| OCT 2003 01... | 1300 | 1028 | 9813 | 44 | 11.6 | 7.9 | 7.7 | 363 | 346 | 13.7 | 140 | 34.9 | 13.7 |
| DEC 03... | 1250 | 1028 | 9813 | 50 | 14.2 | 7.9 | 8.0 | 348 | 366 | 3.8 | 140 | 33.0 | 13.2 |
| FEB 2004 24... | 1120 | 1028 | 9813 | 44 | 15.7 | 8.2 | 8.1 | 374 | 369 | 4.9 | 140 | 34.7 | 13.5 |
| APR 06... | 1050 | 1028 | 9813 | 51 | 15.2 | 7.7 | 8.0 | 367 | 368 | 5.4 | 140 | 33.3 | 13.6 |
| JUN 14... | 1110 | 1028 | 9813 | 36 | 9.8 | 7.8 | 7.0 | 388 | 381 | 16.7 | 140 | 32.9 | 12.7 |
| AUG 19... | 1030 | 1028 | 9813 | 42 | 9.6 | 7.8 | 7.4 | 389 | 376 | 19.8 | 150 | 35.4 | 14.5 |

| Date | ANC, wat unfltrd end pt, lab, mg/L as CaCO3 (00417) | Sulfate water, fltrd, mg/L (00945) | Residue on evap. at 105degC wat fltrd, mg/L (00515) | Residue total at 105 deg. C, suspended, mg/L (00530) | Ammonia water, unfltrd mg/L as N (00610) | Nitrate water unfltrd mg/L as N (00620) | Nitrite water, unfltrd mg/L as N (00615) | Ortho-phosphate, water, unfltrd mg/L as P (70507) | Phosphorus, water, unfltrd mg/L (00665) | Total nitrogen, water, unfltrd mg/L (00600) | Organic carbon, water, unfltrd mg/L (00680) | Aluminum, water, unfltrd recover -able, µg/L (01105) | Copper, water, unfltrd recover -able, µg/L (01042) |
|----------------|---|------------------------------------|---|--|--|---|--|---|---|---|---|--|--|
| OCT 2003 01... | 81 | 36.6 | 458 | <2 | <.020 | 4.66 | <.040 | .08 | .098 | 5.1 | 3.2 | <200 | <10 |
| DEC 03... | 72 | 37.6 | 282 | 18 | <.020 | 5.36 | <.040 | .07 | .075 | 5.5 | 2.1 | <200 | <10 |
| FEB 2004 24... | 67 | 37.1 | 112 | 2 | <.020 | 5.40 | <.040 | .06 | .074 | 5.5 | 2.1 | <200 | <10 |
| APR 06... | 71 | 35.5 | 300 | 6 | <.020 | 4.53 | <.040 | .06 | .079 | 5.0 | 3.0 | <200 | <10 |
| JUN 14... | 84 | 35.7 | 290 | 8 | .040 | 4.72 | <.040 | .12 | .126 | 5.1 | 2.7 | 220 | <10 |
| AUG 19... | 81 | 33.5 | 230 | 2 | <.020 | 4.84 | <.040 | .16 | .176 | 5.0 | 2.7 | <200 | <10 |

| Date | Iron, water, unfltrd recover -able, µg/L (01045) | Lead, water, unfltrd recover -able, µg/L (01051) | Manganese, water, unfltrd recover -able, µg/L (01055) | Nickel, water, unfltrd recover -able, µg/L (01067) | Zinc, water, unfltrd recover -able, µg/L (01092) |
|----------------|--|--|---|--|--|
| OCT 2003 01... | 200 | <1.0 | 40 | <50 | <10 |
| DEC 03... | 220 | <1.0 | 40 | <50 | 190 |
| FEB 2004 24... | 110 | <1.0 | 30 | <50 | <10 |
| APR 06... | 230 | <1.0 | 50 | <50 | <10 |
| JUN 14... | 360 | <1.0 | 50 | <50 | 80 |
| AUG 19... | 150 | <1.0 | 10 | <50 | <10 |

CHRISTINA RIVER BASIN

01479820 RED CLAY CREEK NEAR KENNETT SQUARE, PA--Continued

BIOLOGICAL DATA
BENTHIC MACROINVERTEBRATES

REMARKS.--Samples were collected using a D-Frame net with a mesh size of 500 µm. Samples represent counts per 100 animal (approximate) subsamples.

| Date | 09/08/03 |
|----------------------------------|----------|
| Benthic macroinvertebrate | Count |
| Platyhelminthes | |
| Turbellaria (FLATWORMS) | |
| Tricladida | |
| Planariidae | 15 |
| Mollusca | |
| Bivalvia (CLAMS) | |
| Sphaeriidae | 1 |
| Annelida | |
| Oligochaeta (AQUATIC EARTHWORMS) | |
| Tubificida | |
| Naididae | 4 |
| Arthropoda | |
| Acariformes | |
| Hydrachnidia (WATER MITES) | 2 |
| Crustacea | |
| Amphipoda (SCUDS) | |
| Gammaridae | |
| <i>Gammarus</i> | 14 |
| Insecta | |
| Ephemeroptera (MAYFLIES) | |
| Baetidae | |
| <i>Baetis</i> | 11 |
| Ephemerellidae | |
| <i>Serratella</i> | 1 |
| Heptageniidae | |
| <i>Stenonema</i> | 1 |
| Trichoptera (CADDISFLIES) | |
| Hydropsychidae | |
| <i>Hydropsyche</i> | 39 |
| <i>Potamyia</i> | 1 |
| Coleoptera (BEETLES) | |
| Elmidae (RIFFLE BEETLES) | |
| <i>Optioservus</i> | 3 |
| <i>Oulimnius</i> | 1 |
| <i>Stenelmis</i> | 13 |
| Psephenidae (WATER PENNIES) | |
| <i>Psephenus</i> | 4 |
| Diptera (TRUE FLIES) | |
| Chironomidae (MIDGES) | 8 |
| Empididae (DANCE FLIES) | |
| <i>Chelifera</i> | 1 |
| Simuliidae (BLACK FLIES) | |
| <i>Simulium</i> | 1 |
| Total Organisms | 120 |
| Total Taxa | 17 |